ConferenceXP Research Platform

Toward an Extensible Collaborative Environment

NICE - Sept 22, 2004

Michel Pahud,
Research SDE
University Relations
Microsoft Research

Presentation overview

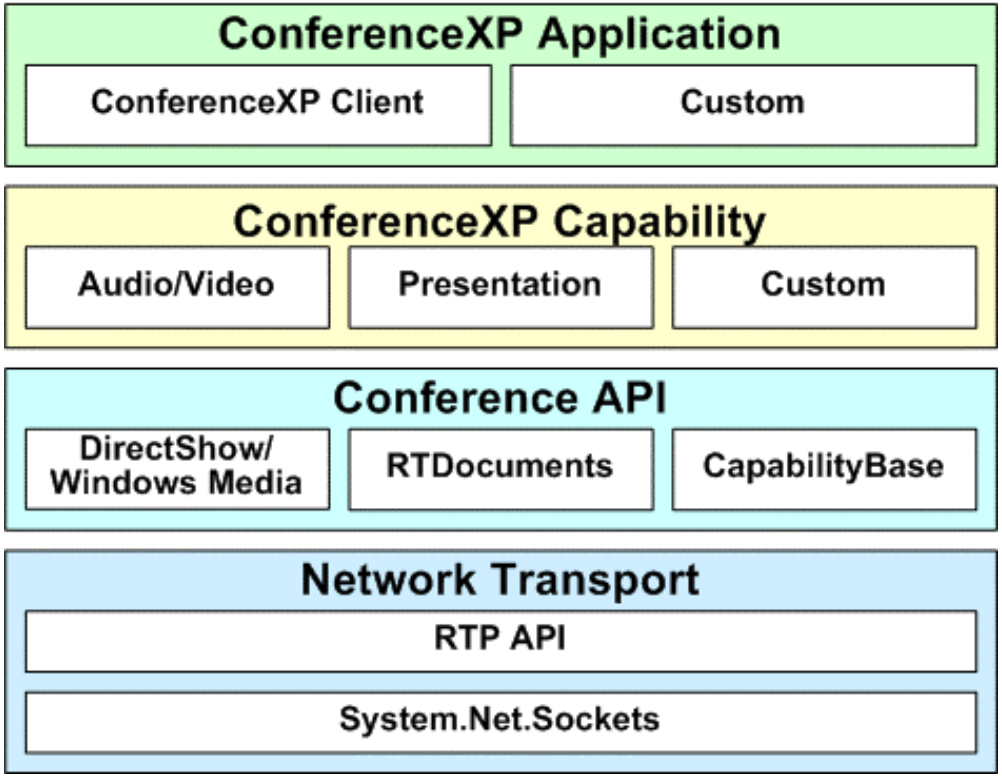
- **Introduction**
  - ConferenceXP Architecture
- **Example on How to Create a Capability**
  - Capability Support Architecture + Simple Capabilities
  - Ink-based Capability / Document-based Capability
- **Demonstrations of Collaborative Prototypes**
  - Visio capability / Tablet PC Story / Distributed Assessment
- **High Bandwidth Capabilities**
- **Future Work / Related Work / Conclusions** /

Goal of this Presentation

- Show how ConferenceXP research platform can be used to create rich collaborative application
- Look for collaboration opportunities with Universities

ConferenceXP Architecture

Rich framework for developing real-time collaborative applications or extending ConferenceXP



CXP Client

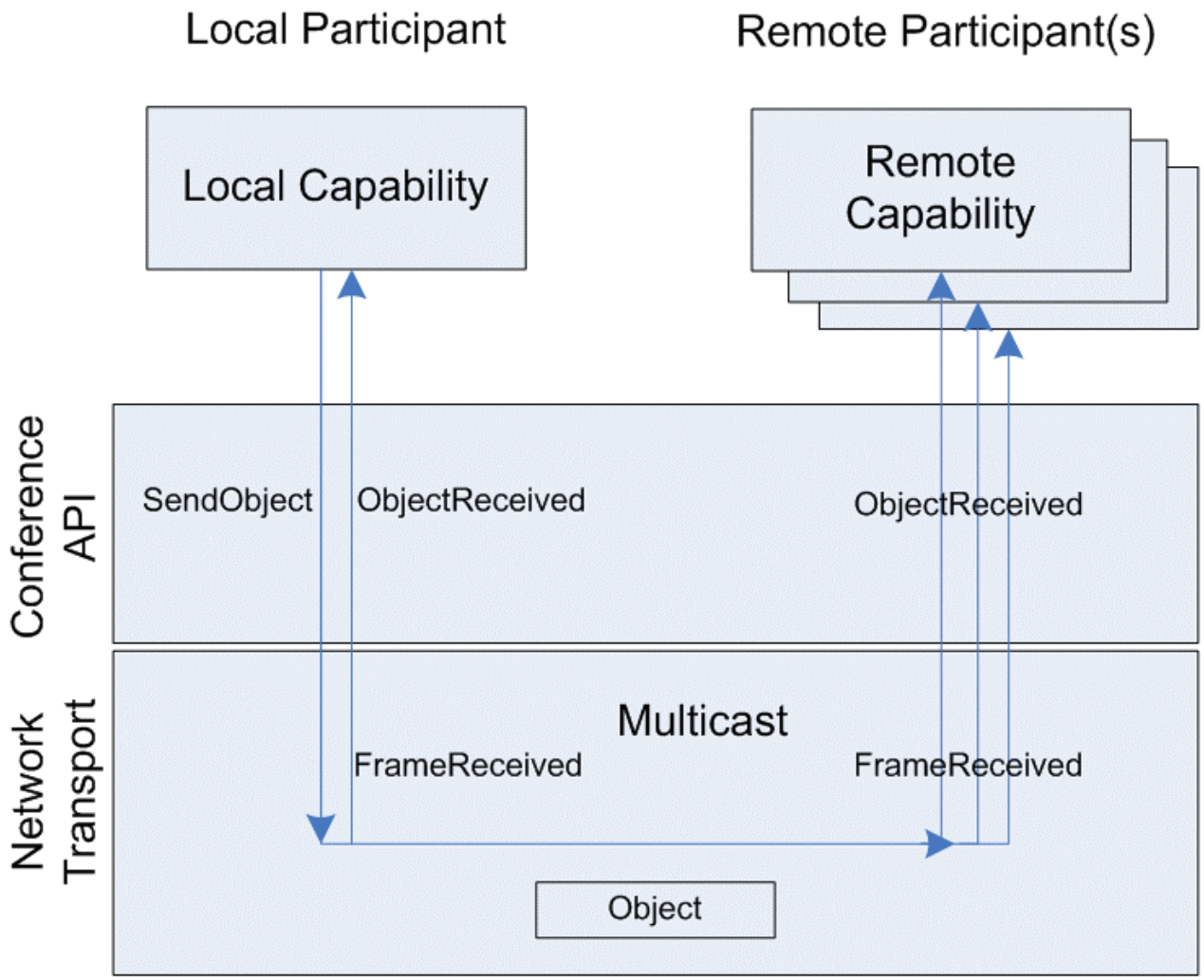
Collaborative applications

RTDocument, RTStroke, Venue support, etc.

Custom implementation of RTP protocol
Wireless - FEC Reed Solomon

Written in managed code!

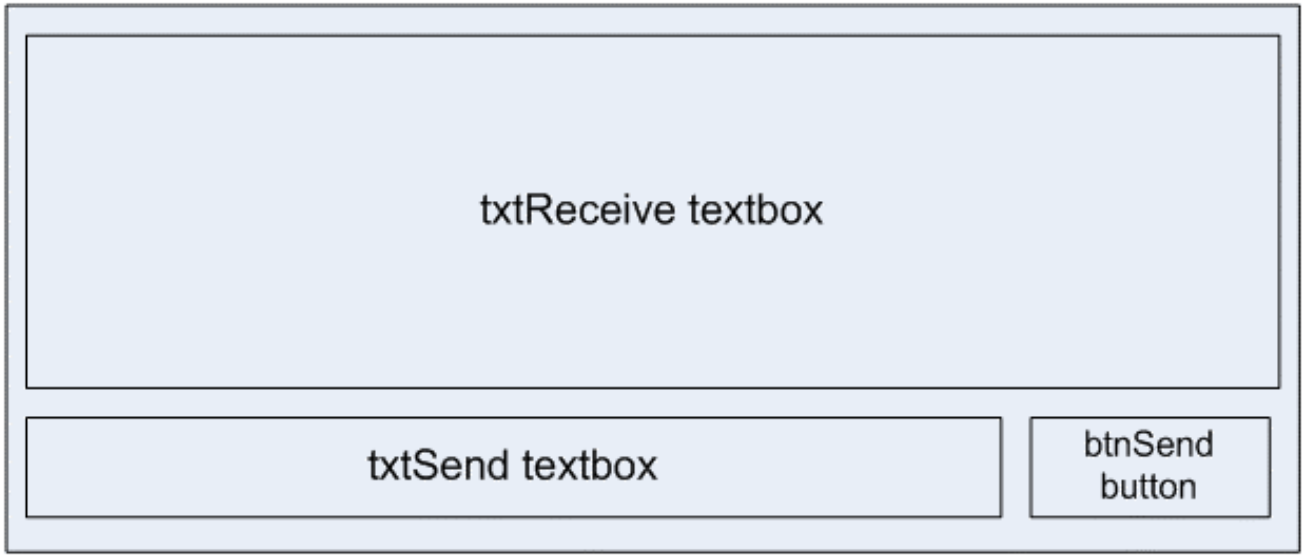
Capability Architecture



How to Create a Chat Capability?

⇒ **Very easy using the Capability API**

User interface of a simple Chat capability:



PS: CXP source code contains this capability

Capability Attributes

Example in C#, but could be any .NET language:

```
[Capability.Name("Chat")]
[Capability.PayloadType(PayloadType.xAppli
    cation1)]
[Capability.FormType(typeof(ChatFMain))]
[Capability.Channel(true)]
```

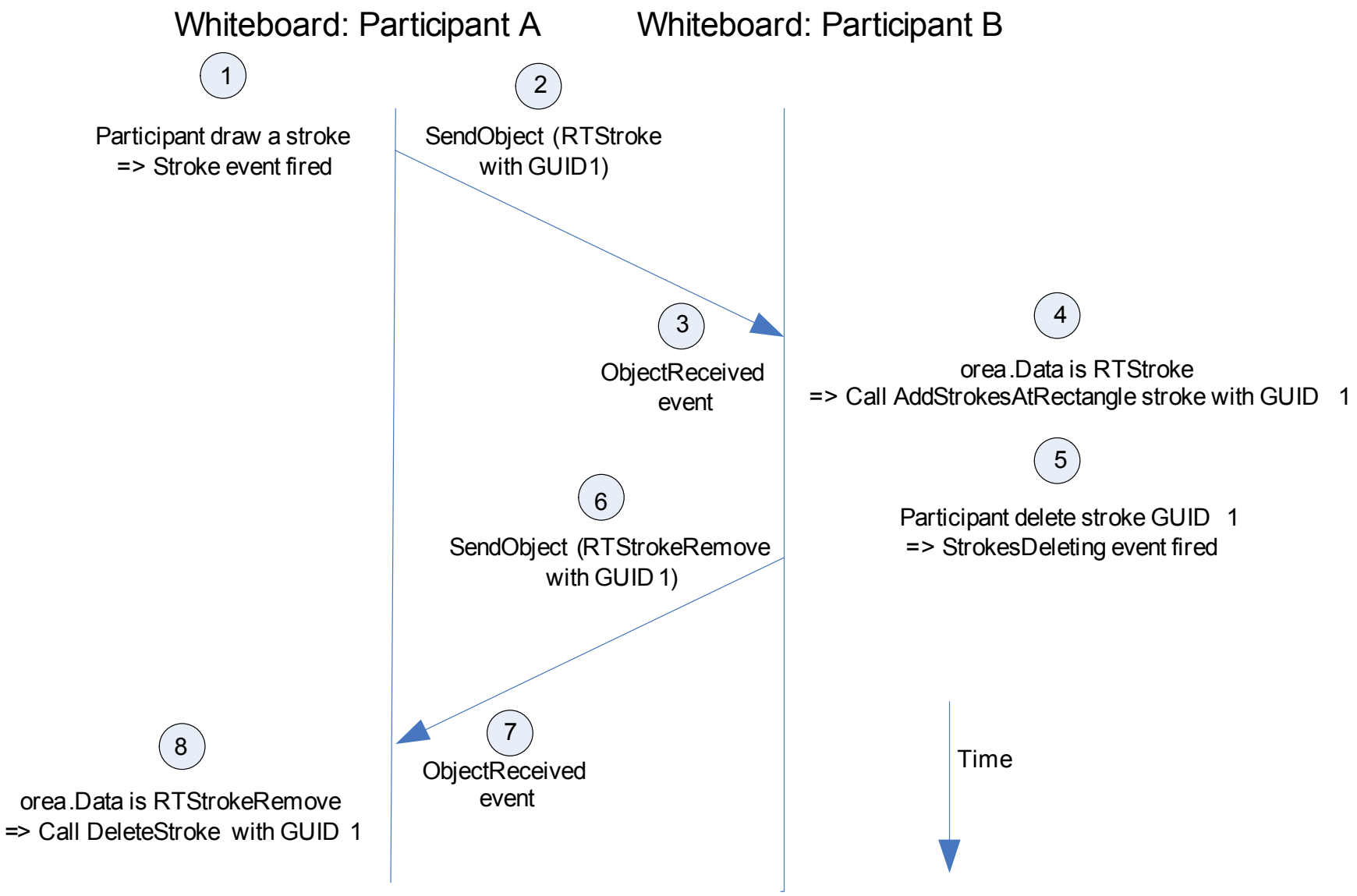
Chat Send/Receive methods

```
public class ChatCapability {  …
  void btnSend_Click( … )
  {   // Send to multicast group (venue)
      this.SendObject(txtSend.Text);
  }
  …
  void objectReceived(object o, ObjectReceivedEventArgs orea)
  {    // Receive from multicast group (venue)
    if (orea.Data is String)
    {       txtReceive.Text = orea.Participant.Name
                  +  ": "          +  (string)orea.Data;
    }   // filter out: if (orea.Participant != Conference.LocalParticipant)
  }
    …
}
```

Ink-oriented collaborative applications

- **Tablet PC stroke events**
  - **NewPackets event -** while a stroke is being drawn
  - **Stroke event -** Completion of a stroke
  - **StrokesDeleting event –** before the stroke is deleted
- **Tablet PC stroke methods**
  - **AddStrokesAtRectangle method –** add a stroke
  - **DeleteStroke method –** delete a stroke
- **ConferenceXP RTStroke object –** embed stroke guid

RTStrokes exchanges



Need code examples of capabilities?

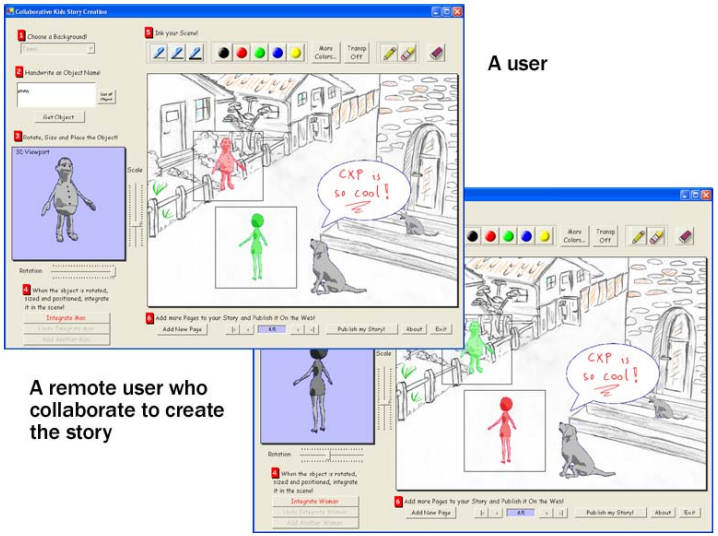
- Download CXPClient: www.conferencexp.net
- String exchange
  ⇒ Chat Capability
- Stroke and document exchange (RTStroke, RTDocument) and snapshot insertion
  ⇒ CXP Presentation capability

Demo of prototypes

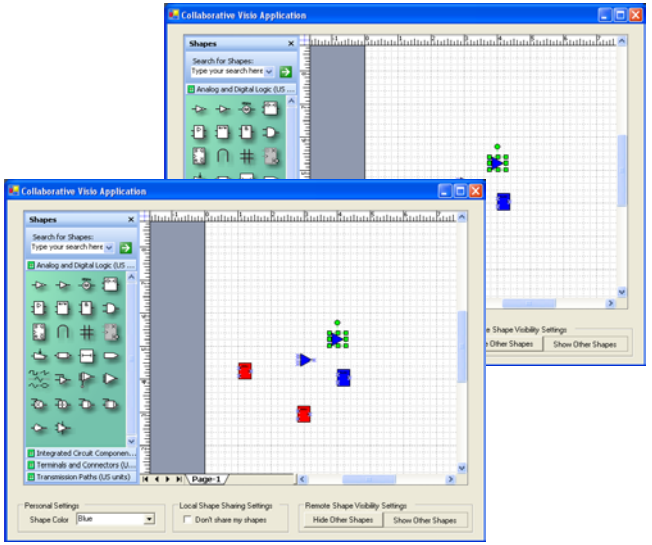
- **Goal of these prototypes**
  - Ensure that CXP can be used a collaborative platform
  - Generate ideas for others
  - These prototypes were created in a few hours
    - ⇒ Show how CXP platform can help to quickly validate collaborative ideas
    - ⇒ Easy to turn standalone applications to collaborative applications
  - Create a SDK with broad range of examples
  - Discover how we can improve Capability API

Demo of prototypes

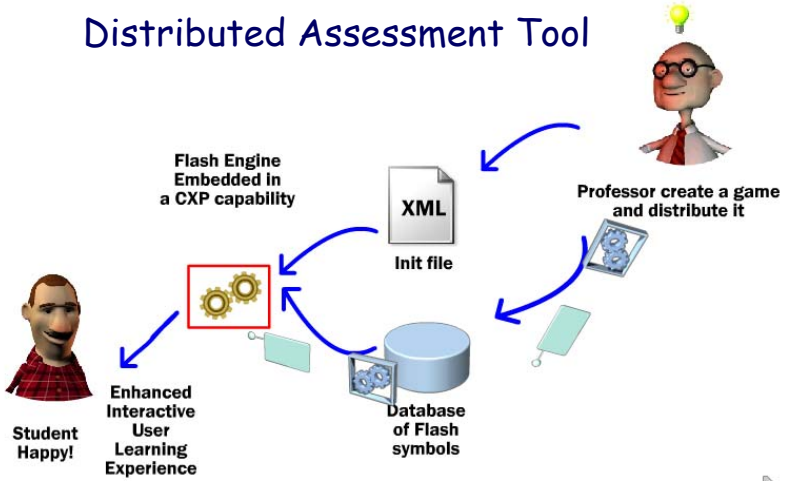
Collaborative Story Creation



Collaborative Drawing Tool (Visio)



Distributed Assessment Tool



Audio/Video Capability

- **High bandwidth / High Quality Video**
- **Quality:**
- **Low:** 256Kbits/s – 320x240
- **Medium:** 512Kbits/s – 320x240
- **High:** 2 Mbits/s - 640x480
- Codec used: WM7
- Future: WM9 (already work in internal version)

ConferenceXP 3.0 Beta

Area	Major Enhancements and Features
Networking	Improved support for collaborative applications in **wireless** environments (Reed-Solomon FEC)
	Reduced network bandwidth requirements for A/V (XOR FEC)
Audio/Video	Improved camera support (Osprey, Winnov, …)
Usability	Windows Media 9 – style Video Windows
	Client UI Enhancements (incl. streamlined A/V config, manage venues, select RTDocs viewer)
Other	Improved performance counters and diagnostics

Future Work

- **CXP Future work**
  - Shared Form
  - Retransmission (network level)
- **Collaborative Application Future Work**
  - Generic Constraints Solving investigation
  - Capability SDK
  - Eventually sub-grouping (network level)

Related Work

- **Access Grid**
  - A lot in common (peer-to-peer, virtual venues, Shared Application)
  - AG Shared Application uses TCP/IP
  - AG persist more state an application data in Venue Server vs CXP goal in mind ease of deployment
  - CXP Based on the .NET FMK, so capabilities can be written in any .NET language (C#, VB.NET, others)

  ⇒ We are investigating interop strategy AG/CXP
- **Collaboration with many Universities**

  ⇒ University of WA, Brown University, etc…

Getting Involved

- Join the community on the ConferenceXP Community Site
  - http://www.conferencexp.net
  - confxp@microsoft.com
  - Download the ConferenceXP 3.0 Beta

Credits

- ConferenceXP Team:
  - Chris Moffatt, Jason Van Eaton, Jay Beavers, Tim Chou, Patrick Bristow
- Natural Language Processing Team:
  - Takako Aikawa, Lee Schwartz